REMARKS

In view of the herein contained remarks, Applicants respectfully request reconsideration and withdrawal of each of the outstanding rejections set forth in the above-mentioned Official Action, together with an indication of the allowability of all of the claims pending in the present application.

In the Official Action, the Examiner has rejected claims 1, 2, 6, 7, 11, 12, 21, and 22 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,579,516 to VAN MAREN et al. in view of U.S. Patent No. 5,740,445 to OKUDA; rejected claim 3, 4, 8, 9, 13, 14, 18, 19, 23, and 24 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,485,321 to LEONHARDT et al. in view of OKUDA; and rejected claims 5, 10, 15, and 25-27 under 35 U.S.C. § 102(a or b) as being anticipated by European Patent Application No. EP 0730274 to CAFFARELLI.

Applicants respectfully traverse and assert that the rejections are inappropriate at least based the remarks contained herein.

As disclosed at page 9, lines 6-15, the presently disclosed invention provides a data storage medium whereby data files recorded to the medium and file management information for managing these data files can be recorded and reproduced. Unrecorded areas can be retrieved using only the volume/file structure, and various areas where invalid data is recorded in the volume space can be reused. Moreover, the presently disclosed invention provides a data storage medium achieving a high reliability file structure by plurally recording file

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management information. In particular, the presently disclosed invention twice

writes the chaining information that is part of the root directory file management

information. Each chaining information has address information for two locations

of chaining information recorded thereafter, address information for an unrecorded

area, and the latest root directory file management information.

The aspect of the present disclosed invention that is recited in independent

claims 1, 6, 11, 16, and 21 includes recording start address information of an

unrecorded area. This is shown as part of, for example, block 143 of figure 4.

More specifically, this start address information of an unrecorded area is part of

the root directory file management information 143 and provides a start address

for an unrecorded area 412.

Contrary to the present invention, VAN MAREN et al. is directed to a

method for storing a set of files on a multiple volume media set that supports the

ISO/IEC 13346 standard for optical media while minimizing swapping and

temporary storage requirements when the multiple volume media set is used in an

optical disk autochanger. More specifically, VAN MAREN sequentializes the

meta-data of the file set before writing it to the media set to optimize on-line

performance to achieve these advantages. In particular, VAN MAREN discloses a

root directory D0 and subdirectories D1 and D2, and each directory including

information control blocks (ICBs) pointing to the directory itself, as well as to

associated subdirectories (see column 4, lines 31-62).

However, there is no disclosure in VAN MAREN of including a start address of an unrecorded area in the root directory. Moreover, VAN MAREN does not disclose any use of unrecorded areas.

OKUDA is directed to generating directory information for the purpose of managing files using directories. More specifically, as shown in figure 2, OKUDA shows an example of the format of a directory entry. In particular, a serial number 101 is information for identifying a given directory entry; a file name 102 is a name of a file indicated by the directory entry; an attribute 103 is used for discriminating a type of the directory entry; position information 104 indicates a position (e.g., a sector address) on the recording medium where a file managed by the directory entry is recorded; a file size 105 indicates a size (a used sector count, a byte count, and the like) of a file managed by the directory entry; and parent information 106 is information for identifying a parent directory of the directory entry. However, OKUDA does not disclose the use of a start address for an unrecorded area and further does not disclose the use of a start address for an unrecorded area in the root directory.

In other words, both VAN MAREN and OKUDA fail disclose use of start address information for an unrecorded area as recited by claims 1, 6, 11, 16, and 21.

Moreover, there is no suggestion or disclosure in VAN MAREN et al. or OKUDA separately or in any proper combination that render obvious the features of the present claimed invention including, inter alia, start address information for

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an unrecorded area existing in a volume space, the start address information being

recorded in the volume space as part of root directory file management

information as recited by claim 1; recording chaining information comprising

recording start address information for an unrecorded area existing in a volume

space as part of root directory file management information as recited by claim 6;

a chaining information recorder that records start address information for an

unrecorded area existing in a volume space as part of root directory file

management information as recited by claim 11; recording chaining information

comprising recording start address information for an unrecorded area existing in a

volume space as part of root directory file management information as recited by

claim 16; and a chaining information recorder that records start address

information for an unrecorded area existing in a volume space as part of root

directory file management information as recited by claim 21.

Thus, Applicants respectfully assert that claims 1, 6, 11, 16, and 21 are

allowable.

The aspect of the invention set forth in claims 3, 8, 13, 18, and 23 includes,

inter alia, invalid data and invalid extent management information.

As disclosed at page 47, lines 1-10, the presently disclosed invention

manages invalid extents data recording areas such as overrun extents (125 of

figure 6) that are not used for retrieving the volume/file structure. All allocated

areas within the volume space can be managed by a file structure in a data storage

medium according to the present invention. In particular, invalid extents are

included as part of the file root entry 147 that points to overrun extents 125. Therefore, in the data storage medium, the number of times for recording data to a same area is limited, large size overrun extents occupying several megabytes or more can be used effectively as file recording areas, and the volume space can therefore be used efficiently and without waste.

With respect to claims 3, 8, 13, 18, and 23, the Examiner indicates that at column 12, lines 45-64, of LEONHARDT et al. disclose recording invalid data before and after a volume/file structure and a data file, as recited in claims 3-4 and 8-9 of the present invention.

However, the cited portion of LEONHARDT et al. only discloses markers that designate the beginning and end of valid data blocks. Although LEONHARDT et al. disclose setting header field designations for valid and invalid data, there is no recording of invalid data blocks. Moreover, LEONHARDT et al. does not disclose that the invalid data is recorded before and after volume/file structure and a data file. Finally, LEONHARDT et al. does not disclose any invalid extent management information.

With respect to OKUDA, this reference also does not disclose use of invalid data or invalid extent management information. As noted above, OKUDA shows, in figure 2, an example of the format of a directory entry. In this regard, OKUDA does not disclose use of valid or invalid extent management information.

Applicants thus respectfully assert that these claims are allowable because there is no suggestion or disclosure in LEONHARDT et al. or OKUDA separately

or in any proper combination that render obvious the features of claims 3, 8, 13, 18, and 23 including, inter alia, invalid data not used for retrieving volume/file structure, the invalid data being recorded before and after volume/file structure and a data file, and invalid extent management information for managing an invalid data recording area, the invalid extent management information being recorded in a volume space as part of root directory file management information as recited by claim 3; recording chaining information comprising recording invalid data not used for retrieving volume/file structure before and after volume/file structure and a data file, and recording invalid extent management information for managing an invalid data recording area as part of root directory file management information as recited by claim 8; a chaining information recorder that records invalid data, not used for retrieving volume/file structure, before and after volume/file structure and a data file, and that records invalid extent management information, for managing an invalid data recording area, as part of root directory file management information as recited by claim 13; recording chaining information comprising recording invalid data not used for retrieving volume/file structure before and after volume/file structure and a data file, and recording invalid extent management information for managing an invalid data recording area as part of root directory file management information as recited by claim 18; and an address information recorder that records address information for a root directory, and a chaining information recorder that records invalid data not used for retrieving volume/file structure before and after volume/file structure and a

data file, and that records invalid extent management information for managing an

invalid data recording area as part of root directory file management information

as recited by claim 23.

Thus, Applicants respectfully assert that these claims 3, 8, 13, 18, and 23

are allowable.

Regarding the rejection of independent claims 5, 10, 15, and 25-27, the

Examiner has relied on column 15, lines 23-46 of CAFFARELLI to disclose

plurally recording root directory file management information as main chaining

information and reserve chaining information. However, the cited portions of

CAFFARELLI do not disclose multiple sets of chaining information. To the

contrary, column 15, lines 23-46, are directed to a directory structure field 380 that

contains a subset of basic information that enables the file system to rapidly

determine the relationship between directories and files, and to rapidly access

these directories and files without having to chain through file/directory records.

Moreover, the Examiner specifically identified element 505 of Fig. 10 as

corresponding to the reserve information area. However, whereas the reserve

chaining information of the present invention is essentially a duplicate of the main

chaining information, element 505 of Fig. 10 is described as "reserved if desired

for later addition of other attributes" (See column 14, lines 16-18).

Similarly, OKUDA does not disclose main chaining information and

reserve chaining information. To the contrary, OKUDA is directed to generating

directory information for the purpose of managing files using directories as noted above.

Contrary to the disclosures of CAFFARELLI and OKUDA, the presently disclosed invention has recorded information of the address of the chaining information 173 and reserve chaining information 174 as shown in figure 1 and described on page 20, along with recorded information of the address of the updated chaining information 186 and updated reserve chaining information 187.

There is no suggestion or disclosure in CAFFARELLI or OKUDA separately or in any proper combination that render obvious the features of the present claimed invention including, inter alia, first address information, corresponding to an area in which the main chaining information and the reserve chaining information are recorded at a beginning of a volume space, that is recorded as part of a the file set descriptor, and second address information, corresponding to an area in which the main chaining information and the reserve chaining information is update recorded, that is recorded as part of the main chaining information and the reserve chaining information as recited by claim 5.

Similarly, there is no suggestion or disclosure in CAFFARELLI or OKUDA separately or in any proper combination that render obvious the features of the present claimed invention including, inter alia, recording file set information comprising recording, as part of a the file set descriptor, address information for an area in which main chaining information and reserve chaining information are recorded at a beginning of a volume space, and recording chaining information

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comprising plurally recording the main chaining information and the reserve

chaining information having address information of an area in which root

directory file management information and the main chaining information and the

reserve chaining information are update recorded as recited by claim 10.

Moreover, there is no suggestion or disclosure in CAFFARELLI or

OKUDA separately or in any proper combination that render obvious the features

of the present claimed invention including, inter alia, a file set information

recorder that records, as part of a the file set descriptor, address information for an

area in which main chaining information and reserve chaining information are

recorded at a beginning of a volume space, and a chaining information recorder

that plurally records main chaining information and reserve chaining information

having address information of an area in which root directory file management

information and the main chaining information and the reserve chaining

information are update recorded as recited by claim 15.

There is no suggestion or disclosure in CAFFARELLI or OKUDA

separately or in any proper combination that render obvious the features of the

present claimed invention including, inter alia, a chaining information recorder

that reproduces, using the main chaining information or the reserve chaining

information, following the main chaining information or the reserve chaining

information, or root directory file management information that plurally records

the main chaining information and the reserve chaining information having

address information of an area in which the root directory file management

information and the main chaining information and the reserve chaining information are update recorded as recited by claim 25

Moreover, there is no suggestion or disclosure in CAFFARELLI or OKUDA separately or in any proper combination that render obvious the features of the present claimed invention including, inter alia, reproducing file set information comprising reproducing address information for an area in which main chaining information and reserve chaining information are recorded at a beginning of a volume space using a the file set descriptor, and recording chaining information comprising reproducing, using the main chaining information or the reserve chaining information, following the main chaining information or the reserve chaining information, or root directory file management information as recited by claim 26.

Similarly, there is no suggestion or disclosure in CAFFARELLI or OKUDA separately or in any proper combination that render obvious the features of the present claimed invention including, inter alia, a file set information reproducer that reproduces address information for an area in which the main chaining information and the reserve chaining information are recorded at a beginning of a volume space using a the file set descriptor, and a chaining information recorder that reproduces, using the main chaining information or the reserve chaining information, following the main chaining information or the reserve chaining information, or root directory file management information as recited by claim 27.

Thus, Applicants respectfully assert that 5, 10, 15, and 25-27 are allowable.

With regard to dependent claims 2, 4, 7, 9, 12, 14, 17, 19, 22, and 24, Applicants assert that theses claims are allowable on their own merit and at least because they depend on one of independent claims 1, 3, 5, 6, 8, 10, 11, 13, 15, 16, 18, 20, 21, 23, 25, 26, and 27, which Applicants submit have been shown to be allowable.
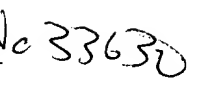
In view of the fact that none of the art of record, whether considered alone or in any proper combination, discloses or suggests the present invention as defined by the pending claims, and in further view of the above remarks, reconsideration of the Examiner's action and allowance of the present application are respectfully requested and are believed to be appropriate.

SUMMARY AND CONCLUSION

Applicants have made a sincere effort to place the present application in condition for allowance and believe that he has now done so. Applicants have pointed out the specific language of Applicants' claims that define over the references of record and respectfully request an indication to such effect, in due course.

Should there be any questions, the Examiner is invited to contact the undersigned at the below-listed telephone number.

Respectfully submitted,
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